IJABS 2019: 6:3


**Original Article**

# Effectiveness of Acceptance and Commitment Therapy on the Life Expectancy, Resilience and Death Anxiety in Women with Cancer

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(Received:5 July 2019; Revised: 30 July 2019; Accepted:10 August 2019)

## Abstract

**Introduction**: An annual record of 90,000 new cases of cancer in Iran and a mortality rate of 55,000 affected cases is indicative of alarming outbreak of cancer in the country to the extent that an average of 100 people die each day due to this disease. The purpose of the present research is to evaluate the effectiveness of acceptance and commitment therapy (ACT) on the life expectancy, resilience and death anxiety in women with cancer.

**Methods**: The present research is a semi-experimental research with pretest-posttest control group design. The research population consisted of all women with cancer who referred to the Cancer Institute of Imam Khomeini Hospital in Tehran in 2017. Thirty women who met the inclusion criteria were randomly divided into two groups: experimental and control. Life expectancy, resilience and death anxiety scales were used and multivariate covariance analysis was applied for data analysis.

**Results**: The results showed that life expectancy increased in the experimental group in compare with the control group ($p<0.05$) and the death anxiety of the experimental group decreased in compare to the control group ($p<0.05$) after acceptance and commitment training.

**Conclusion**: Acceptance and commitment therapy is effective in increasing the life expectancy and resilience and also in decreasing death Anxiety in women patient with cancer. These findings can be used in designing of psychological treatment interventions in the field of cancer.

**Declaration of Interest:** None

***Key words***: Life expectancy, Resilience, Death anxiety, Acceptance, Commitment, Cancer.

## *Introduction*

Despite significant progress of the medical sciences, cancer remains one of the most important and prevalent disease of present century (1). Cancer constitutes the second most common cause of mortality in the world, responsible for about 8.8 million deaths in the year 2015. More precisely, around 14.1 million new cases were diagnosed in the year 2012, according to the official data issued by WHO's GLOBOCAN project (2). Cancer belongs to a category of diseases that are characterized by uncontrolled cellular growth, local tissue invasion, and metastases (3). The incidence of a chronic disease produces a profound impact on the individual's lifestyle

(4). Patients with cancer demonstrate a greater frequency of some psychiatric disorders and other dysfunction than other patients and healthy individuals (5). For many cancer patients, receiving a positive diagnosis of cancer and undergoing its treatment comprise an extremely stressful and potentially traumatic experience that can render individuals vulnerable to long-lasting negative psychological consequences (e.g., emotional distress, depression, anxiety, and impaired quality of life) (6, 7). These impacts would result in distress at all disease stages from diagnosis to therapy and survivorship (8). This problem could lead to more severe symptoms, slower recovery, and poorer health outcomes (9). This is why the modern medicine is making attempts to further understand the connection between mind and body in terms of health and disease, especially concerning cancer patients (10).

It is believed that, hopeful spirit is one of the most important factor and essential elements on cancer patients' adaptation to life conditions, especially at the time of pain and deprivation (11). Resilience comprises the individual's protective attributes and/or personal characteristics (i.e. meaning and purpose in life, sense of coherence, optimism, positive emotions, self-esteem, self-efficacy, cognitive flexibility and coping) which are thought to be modifiable, and can promote successful adaptation to cancer (6, 12). According to the previous literature, anxiety is the most important factor affecting the mental health of cancer patients and the death anxiety is considered as one of the most important psychological factor affecting them (13, 14). Although, there are thoughts on death in almost every period of life, having an illness related to death may prompt facing death term more than ever; Nevertheless at the present day, advances in diagnostic instruments and improved health services still seem inadequate to annihilate feelings of fear and desperateness against death in patients, especially in cancer patients (15). Conclusively, death anxiety is considered as the basic fear underlying the development, maintenance and course of numerous psychological conditions (16).

It is important to note that, acceptance of cancer, or making peace with the disease, is one factor playing significance role in reducing patients' distress (17). Therefore, ignoring psychiatric therapy during the patient's medical treatment brings about for him/her a negative impact on life quality (18). Recent findings assert that in certain cancers, clinical course of the disease is influenced by psychological factors as well as coping style with the same proportion by which the risk of cancer recurrence and metastasis are affected under the influence of the patient's received stress (19).

Given the prevalence of cancer in the society, psychological treatment and support of these people to overcome frustration and anxiety and accordingly improving their life expectancy for better life and more compatibility seem necessary (20). Since ACT can be effective in mitigating some of the cancer patients' problems, the present study uses this healing technique to develop a new treatment for faster recovery and recurrence prevention in these individuals. The aim of ACT is to help patient to attain a rich, perfect and meaningful life, while suffering from the disease (21). The acceptance and commitment therapy originates from a philosophical theory called functional contextualization, relying on a research program about language and recognition which is considered one of the subjective relations framework theories (22). ACT is the third wave of cognitive-behavioral therapies in which processes such as attention, awareness, acceptance, commitment, and behavior changes are used to establish psychological flexibility (23).

A recent review has identified studies using ACT in the contexts of lung, breast, blood, and bladder cancers (24). Many studies have also investigated the acceptance and commitment-based interventions, such as ACT, that have a positive effect on the treatment of patients with chronic pain (25, 26), mental health problems (27, 28), and stress among people with irritable bowel syndrome (IBS) (29). Psychological problems and concerns of cancer patients (30), binge eating disorder (31, 32), dementia recovery (33), Reducing distress and inefficient attitudes in patients with multiple sclerosis (34), the quality of life of patients with type II diabetes (35), depressed pregnant women (36), the quality of life of women with breast cancer (21) and death anxiety in women with MS (37), all are considered as the areas where the ACT could be promissing.

Also, since no previously undertaken research could be found in the literature on evaluating the effectiveness of acceptance and commitment therapy on the life expectancy, resilience and death anxiety within (Iran) country, and considering the urgent need for effective treatment and improvement of the psychological symptoms of such patients, the importance and necessity of the present study is manifested. Thus the purpose of this study was to investigate the effectiveness of acceptance and commitment therapy on the life expectancy, resilience and death anxiety of women with cancer.

**Methodology**:

The present study is a semi experimental research with pretest-posttest control group design. The statistical population included all women with cancer who referred to the Cancer Institute of Imam Khomeini in 2017. A total of 30 women who met the inclusion criteria (at least 18 to 60 years of age, lack of diseases other than cancer, patients undergoing chemotherapy, having no diagnosed evidence of psychiatric disorders) were randomly selected from women with cancer. They were divided into two experimental and control groups (N= 15 for each group). The experimental group underwent ACT for 8 sessions according to Table 1.

Table 1. Treatment sessions adapted from Patterson et al. (38)

| Row | Session topic | Session content |
|---|---|---|
| 1 | Introduction and agenda of the treatment session | Establishing a therapeutic relationship, expressing group rules, familiarizing cancer patients with acceptance and commitment therapy (ACT), a brief explanation of life expectancy, resilience and death anxiety. |
| 2 | Behavior change and mindfulness | Potential values and selection issues, introducing the concept of behavior change, expressing the difference of thoughts, emotions and practices of mindfulness and homework assignment. |
| 3 | Values | Definition of acceptance, identification of values and discussion about it, acceptance of personal events without being involved with them, mindfulness and homework assignment. |
| 4 | Transparency of values | Transparency of values, determining goals and introducing commitment-based action, explaining about avoidance and awareness of mindfulness events, willingness, acceptance and homework assignment. |
| 5 | Discontinuity | Making uniform movement, disconnection, awareness of different sensory receptions, mindfulness and homework assignment. |
| 6 | commitment-based act | Time lapse, commitment-based act, mindfulness and practice of self-observation (attention to the content of thoughts, but not sticking to it) and homework assignment. |
| 7 | Satisfaction | Commitment and barriers to satisfaction, Being in the present time, mindfulness during walking and homework assignment. |
| 8 | End of sessions and conclusions | Transparency of values, conclusions and goodbyes. |

In order to collect information about dependent variables, the three following standard questionnaires have been used: Life expectancy scale (39), Connor-Davidson Resilience scale (CD-RISC) (40), and Death anxiety scale (41).

1. **Life expectancy scale (39):**

This scale was made by Snyder et al (39) for adults over 15 years of age. It consisted of 12 questions and two subscales of agency thinking and strategic thinking (42). The questions were answered based on the 8-point Likert scale (43). The construct validity was evaluated using confirmatory factor analysis and the results showed that the scale had a two-factor structure including agency thinking and strategic thinking. Investigation of concurrent validity by estimating the correlation of this scale with the scale for suicidal ideation, scale of perceived social support and meaning in life scale indicated a negative relationship between life expectancy scale scores with the scores for suicidal ideation and a positive relationship with scores of perceived social support and meaning in life scale. The reliability coefficient of this scale was obtained as equal to 0.86 and 0.81 by using the Cronbach's alpha coefficient and a test-retest method, respectively. The Schneider's life expectancy scale shows a good validity and reliability for the Iranian population (43). In the present research, the internal consistency of the questionnaire on women with cancer was investigated and Cronbach's alpha coefficients of 0.75, 0.81 and 0.86 were obtained for agency thinking, strategic thinking and the whole questionnaire, respectively.

2. **Connor-Davidson Resilience Scale (CD-RISC) (40):**

This scale consists of 25 questions and 5 subscales of personal competence, tolerance of negative affect, positive acceptance of change, control and spiritual influences. This scale is rated based on the 5-point Likert scale (44). The validity of the questions was confirmed by total score of correlation coefficients ranging from 0.21 to 0.72 on Chinese samples. All of the coefficients were significant, which indicated the good construct validity of the questionnaire (44). In this study, the internal consistency of the questionnaire on women with cancer was investigated and Cronbach's alpha coefficients of 0.71, of 0.65, 0.81, 0.80, 0.71 and 0.89 were obtained for 5 subscales of personal competence, tolerance of negative affect, positive acceptance of change, control and spiritual influences and the whole questionnaire, respectively.

3. **Death anxiety scale (41):**

This scale was developed by Templer (41) and consisted of 15 items that measured the attitude of the subjects to death. Subjects specified their answers to any question with the no and yes options. Psychometric properties of the scale were reported to be as follows: test-retest reliability coefficient of the scale=0.83, concurrent validity by its correlation with trait anxiety scale= 0.27, and with the depression scale=40% (41). The internal consistency of the scale on women with cancer was investigated and Cronbach's alpha coefficient of 0.88 was obtained for the whole questionnaire.

**Statistical analysis**

Data analysis was later carried out using multivariate covariance analysis in SPSS ver. 24. To analyze the data, the covariance analysis test was used and the effect of pre-test was eliminated. Before applying the parametric test of covariance analysis, its assumptions were examined. The assumption of normal distribution of the data was evaluated using Shapiro–Wilks test ($p<0.05$). Also, the results of the Leven test indicated the equalization of variances ($p >0.05$).

***Results***

Table 2 Shows the descriptive statistics (mean and standard deviation) for both conditions at pre-test and post-test in both experimental and control groups. As it is evident from the follow Table, the life expectancy and resilience are shown to have increased and death anxiety decreased at post-test for participants in experimental group as compared to the control group.

Table 2. Mean and standard deviation of Dependent Variables at pretest-posttest

| Dependent Variables | | | Experimental Group | | Control Group | |
|---|---|---|---|---|---|---|
| | | | Pre Test | Post Test | Pre Test | Post Test |
| Life Expectancy | Agency thinking | Mean | 12.80 | 15.13 | 12.87 | 13.40 |
| | | SD | 2.597 | 3.091 | 2.326 | 2.530 |
| | Strategic thinking | Mean | 14.40 | 16.67 | 14.93 | 15.60 |
| | | SD | 3.521 | 3.677 | 3.262 | 3.225 |
| Resilience | Personal competence | Mean | 22.60 | 30.20 | 27.07 | 28.27 |
| | | SD | 6.104 | 5.846 | 5.587 | 4.431 |
| | Tolerance of negative affects | Mean | 17.67 | 23.60 | 21.73 | 22.47 |
| | | SD | 5.205 | 4.405 | 4.559 | 4.406 |
| | Positive acceptance of change | Mean | 13.53 | 18.07 | 17.00 | 17.60 |
| | | SD | 2.997 | 3.240 | 3.317 | 3.269 |
| | Control | Mean | 10.07 | 9.73 | 11.80 | 8.20 |
| | | SD | 2.624 | 2.484 | 2.434 | 2.685 |
| | Spiritual influences | Mean | 5.00 | 8.20 | 6.20 | 6.93 |
| | | SD | 1.309 | 1.424 | 1.521 | 1.710 |
| Death Anxiety | Death anxiety | Mean | 11.20 | 8.20 | 11.87 | 11.20 |
| | | SD | 0.862 | 1.373 | 1.125 | 1.372 |

To examine normality of data, Wilkes Lambda and to examine homogeneity assumption of variances, Leven test were used. A summary of the multivariate tests of life expectancy and resilience for women with cancer in the posttest phase is presented in Table 3.

Table 3. A summary of multivariate tests of life expectancy and resilience posttest

| Test | Variables | Values | F test | sig | Impact factor | Power of test |
|---|---|---|---|---|---|---|
| Wilkes Lambda | life expectancy | 0.675 | 6.006 | 0.007 | 0.325 | 0.840 |
| | resilience | 0.365 | 6.884 | 0.001 | 0.644 | 0.987 |

According to the results, the relevant multivariate statistic, Wilks' Lambda, is statistically significant at 0.99% (P<0.01 and F= 0.006). Hence, the null hypothesis is rejected and it turns out that the linear combination of life expectancy and resilience posttest variable was affected by the independent variable (post-test stage) after controlling (eliminating) the pre-test effect.

Given that the multivariate test is meaningful and the linear combination of the dependent variable is affected by the independent variable, it should be examined whether each individual dependent variable has been independently affected by the independent variable. In order to compare the mean post-test scores of life expectancy and resilience after controlling (eliminating) the pre-test effect, the multivariate covariance test (MANCOVA) was used in relation to the two groups, the results of which are presented in Table 4.

Table 4. Results of MANCOVA of life expectancy and resilience in the posttest phase

| The dependent variables | Sum of | DF | Mean | F test | Sig | Impact | Power of |
|---|---|---|---|---|---|---|---|

| | | squares | | squares | state | | factor | test |
|---|---|---|---|---|---|---|---|---|
| Life Expectancy | Agency Thinking | 23.566 | 1 | 23.566 | 10.438 | 0.020 | 0.191 | 0.664 |
| | Strategic Thinking | 17.569 | 1 | 17.569 | 6.121 | 0.001 | 0.656 | 0.999 |
| Resilience | Personal competence | 152.553 | 1 | 152.553 | 19.062 | 0.001 | 0.453 | 0.987 |
| | Tolerance of negative affects | 90.928 | 1 | 90.928 | 11.614 | 0.002 | 0.336 | 0.9004 |
| | Positive acceptance of change | 53.293 | 1 | 53.293 | 8.388 | 0.008 | 0.267 | 0.792 |
| | Control | 50.919 | 1 | 50.919 | 13.213 | 0.001 | 0.365 | 0.936 |
| | Spiritual influences | 19.770 | 1 | 19.770 | 8.060 | 0.009 | 0.259 | 0.776 |

As shown in the above Table, there is a significant difference between the mean posttest of the two variables, life expectancy and resilience, and the control of the pre-test effect. In other words, it can be said that the use of ACT significantly increased the life expectancy and resilience at the posttest phase. Also, the significance level achieved for the life expectancy and resilience variables is smaller than the significance level of 0.025 obtained from the Bonferroni correction (after dividing the significance level of 0.05 by two dependent variables). Therefore, considering the obtained means, it can be said that the life expectancy and resilience of the experimental group has increased compared to the control group by CI 95%.

The adjusted mean and standard deviation of life expectancy and resilience in the posttest phase are presented in Table 5, which are indicative of more changes in the adjusted mean of the research variables in the experimental group than the control group.

Table 5. Adjusted mean and standard deviation of life expectancy and resilience

| | The dependent variables | | Experimental group | Control group |
|---|---|---|---|---|
| Life Expectancy | Agency Thinking | Adjusted mean | 16.90 | 15.18 |
| | | Standard deviation | 0.389 | 0.389 |
| | Strategic Thinking | Adjusted mean | 16.90 | 15.36 |
| | | Standard deviation | 0.438 | 0.438 |
| Resilience | Personal competence | Adjusted mean | 31.89 | 26.58 |
| | | Standard deviation | 0.798 | 0.798 |
| | Tolerance of negative affects | Adjusted mean | 25.08 | 20.98 |
| | | Standard deviation | 0.789 | 0.789 |
| | Positive acceptance of change | Adjusted mean | 19.40 | 16.26 |
| | | Standard deviation | 0.711 | 0.711 |
| | Control | Adjusted mean | 12.47 | 9.40 |
| | | Standard deviation | 0.554 | 0.554 |
| | spiritual influences | Adjusted mean | 8.82 | 6.61 |
| | | Standard deviation | 0.442 | 0.442 |

Table 6 shows the results of the univariate covariance analysis of death anxiety in the experimental and control groups. According to the results shown in the follow table, ACT reduced the death anxiety in the experimental group by controlling the pre-test scores ($P<0.001$) with the impact rate of 16.1. Therefore, it can be concluded that the ACT is effective on the death anxiety of women with

cancer. Table 6 results also show that the significance level obtained for the anxiety variable is smaller than the significance level of 0.05 obtained from the Bonferroni correction. Therefore, considering the obtained means, it can be said that the death anxiety rate of the experimental group has decreased as compared to that of the control group by CI 95%.

Table 6. Results of ANOVA of death anxiety in the posttest phase

| Source | Sum of squares | Degrees of freedom | Mean squares | F test state | Significance | Impact factor | Power of test |
|---|---|---|---|---|---|---|---|
| Pre-test | 8.873 | 1 | 8.873 | 5.454 | 0.027 | 0.168 | 0.615 |
| Group | 46.226 | 1 | 46.226 | 28.413 | 0.001 | 0.513 | 0.999 |
| Error | 43.927 | 27 | 1.627 | - | - | - | - |
| Total | 2943.000 | 30 | - | - | - | - | - |

The adjusted posttest mean and standard deviation of death anxiety are presented in Table 7. As the results show, the adjusted mean of research variables in the experimental group exhibited a greater decrease than those in the control group.

Table 7. Adjusted mean and standard deviation of death anxiety

| The dependent variables | | Experimental group | Control group |
|---|---|---|---|
| Death anxiety | Adjusted mean | 8.39 | 11.01 |
| | Standard deviation | 0.339 | 0.339 |

## 4. Discussion

The aim of this study was to evaluate the effectiveness of acceptance and commitment therapy on life expectancy, resilience and death anxiety in women with cancer. Accordingly, two experimental and control groups were studied and analyzed in two pretest and post-test stages using Life Expectancy Scale, CD-RISC and Templer Death Anxiety Questionnaire. Results of the study revealed that an increase in cognitive flexibility ―as the main component of acceptance and commitment therapy― had a significant effect on increasing the variables of life expectancy and resilience, meanwhile reducing the death anxiety variable.

The results also showed that there was a significant difference between the mean of post-test scores of life expectancy and control of pre-test effect (significance level 0.99, P <0.01). In other words, it can be said that the ACT significantly increased the post-test life expectancy (agency thinking: 16.90, strategic thinking: 16.90) among women with cancer. This finding has a good agreement with that of the previous studies. Moghaddam et al. (45) indicated that following the provision of acceptance and commitment therapy, the scores of life expectancy and psychological well-being increased in the experimental group in the post-test phase of women with cancer under chemotherapy. Malmir et al. (22) acknowledged in her research that the acceptance and commitment therapy led to the anxiety reduction and caused an increase in bereaved patients' life expectancy. The results of Asqari and Donyavi (46) research showed that ACT significantly improved life expectancy in patients with MS. Dashti and Momeni (47) showed that ACT was an effective method in rising life expectancy in women with breast cancer. Ghadampoor et al. (48) showed that acceptance and commitment therapy based on increasing social competence and life expectancy of patients with multiple sclerosis had significant effect and the findings maintained continuity in the follow-up phase. This finding can be explained by referring to the fact that the main emphasis of ACT approach lies on helping people to achieve

vibrant, purposeful and meaningful life (49). Hope is a process in which people in the first step define their goals, then create strategies to reach those goals, and in the third step create incentives for the implementation of these strategies and hold these incentives throughout the whole process; on the other hand, the basic and major principles of ACT therapy is determining values, stipulating them to the goals, and making a commitment to materialize them (20). This overlap can be an important reason for the positive impact of this therapy on the patients' life expectancy.

Another finding of the present study is that there is a significant difference between the mean scores of post-test resilience and pre-test effect control (at 99% significance level, $P<0.01$). In other words, it can be said that ACT significantly increased the mean resilience score (the personal competence: 31.89, tolerance of negative affect: 25.08, positive acceptance of change: 19.41, control: 12.47 and spiritual influences: 8.82) of women with cancer in the posttest phase. Findings of this research are consistent with those of other studies. Significant improvements were observed in Sadeghi et al. (24) study. The results showed that acceptance and commitment program appears to be an effective therapeutic intervention for improving quality of life and resilience of breast cancer patients. The results of Seyyed Jafari et al. (50) study indicate that acceptance and commitment therapy is effective in increasing resilience in the elderly. The results of J Udell et al. (51) study supported the efficacy of acceptance and commitment therapy in increasing resilience and reducing attrition of injured US navy recruits. This finding may be explained by referring to the fact that generally ACT has taken its name from its main message: accept what is beyond your personal control and commit to an action that enriches your life (52). ACT serves this purpose by exposing the patient to negative thoughts, emotions, and feelings in a controlled manner. Improving resilience through targeted interventions that promote positive adaptation to cancer caused improvement of the health outcomes by strengthening personal and social resources and enabling effective coping strategies (6). Resilience appears to be a process that can be developed at any time during the lifespan (53). Therefore, it can be concluded that instruction of ACT group therapy had a significant impact on the level of resilience.

The final finding of the present study was that training the ACT by controlling the pre-test scores (at a significant level of 0.99) reduced the death anxiety in the experimental group. Therefore, ACT is effective on death anxiety (8.39) of women with cancer. The result is consistent with the findings of other studies including Zarei and Visiani (54), Bayati et al. (55), Safari Mousavi et al. (37) and Mirzaei Doostan et al. (28). All researches concur that acceptance and commitment therapy have been effective in reducing the death anxiety and confirm this efficacy, and the results are consistent with those of other studies. This finding can be explained by referring to the fact that the pivotal processes of acceptance and commitment therapy in this study were to educate the techniques that patients used to control thought, i.e. how to deal with the disturbing thoughts about death and how to manage and control their emotions (55). ACT teaches the patients how to cope with the anxiety-related discomfort and exercise their control (23). Meaning is not only embedded in pleasure and gladness and joy but can also be found in pain and death (22). As supportive relationships build self-worth and create meaning, a positive philosophy of life or a coherent set of life beliefs would develop, allowing for confrontation of death without fear (56).

In the obtained explanation, rehabilitating cancer survivors from the traumatic event of living with cancer has become a topic of great interest in cancer research. The subtle point is that ACT, through such processes, leads to a reduction in the mark; but as it is, it's the product and not the target. However, this psychotherapy approach has managed to overcome many problems and control them. ACT treatment improves clients' ability to relate to their present experience and based on what is possible at the moment. This treatment allows patients to accept their physical and psychological emotions and symptoms. Acceptance is an important alternative to avoidance and helps the patient to actively and consciously accept personal events, and to make every effort to achieve the goal. Therefore, according to the aforementioned discussion, it seems logical to conclude that this type of treatment had a significant positive effect on women with cancer. In accordance with this trial and previous reports, the ACT proves effective against some of the problems of cancer patients and, this treatment technique could be recommended to be integrated into treatment plans for a faster recovery and recurrence prevention in these individuals.

## 5. Applied research recommendations

Considering the significant role of the woman in the family and the results of the present study, it is recommended strengthening the family bond and increase life expectancy, resilience and reduce death anxiety and thereby solving the problems of women with cancer and to prevent disputes and problems caused by the disease as well as disability of these women, through holding training courses and using ACT-based techniques. This research, as well as other studies in the field of behavioral science, was faced with some restrictions including the available sampling method and data collection instrument that was limited to the use of questionnaire only. It is also recommended to carry out further research on effectiveness of this treatment of cancer patients by type of disease. In addition, this study eventually failed to report cancer stages then it is strongly recommended that further research be considered to address this point. Also, since this research has only been carried out on the female population with cancer, it is thus recommended to investigate the effectiveness of this treatment on male population with cancer as well.

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